

DETAILED ACTION

Remarks

This Office action is responsive to applicant's amendment filed on May 26, 2011.

Claims 1-11 and 13-20 are pending.

This Office action presents a new ground of rejection and is made NON-FINAL.

Terminal Disclaimer

The terminal disclaimer filed on May 26, 2011 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of application No. 10/541,063 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9, 15-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al. (2002/0037458) in view of Schmidt et al. (EP 1088814).

For claims 1, 7, 9, 15-18: Yamaguchi teaches a secondary battery having a positive electrode of lithium-manganese composite oxide and lithium nickel composite oxide,

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exemplified by a weight ratio of 80:20, with LiPF₆. See par. [0224]. The electrolyte solution comprises a vinylidene carbonate, *inter alia*. See par. [0017]

For claims 2-4, 8 and 20, the composition of the cathode active material is LiM_{1.8}Cr_{0.2}O₄ and LiNi_{0.8}Co_{0.2}O₂. As to a hydrogen ion scavenger function, it is noted that page 19 of applicant's specification discloses that "[b]y further mixing a lithium-nickel composite oxide as a hydrogen ion scavenger in the positive electrode, in addition to those materials, elution of manganese can more effectively be inhibited." Claim 4 is noted to recite that "the hydrogen ion scavenger is a lithium-nickel composite oxide having a hydrogen ion scavenging function, and is mixed with the positive electrode." As Yamaguchi similarly disclose mixing of lithium-nickel composite oxide in its positive electrode, it is asserted that the property of a hydrogen ion scavenger is present, inherently, absent of a showing by applicant that the claimed invention distinguishes over the reference. *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977) and *In re Spada*, 15 USPQ 2d 1655 (Fed. Cir. 1990).

For claims 5 and 6, the prior does not explicitly teach the surface area and diameter of the composite oxide. However, it is asserted that optimization of the surface area and diameter of the composite oxide is in the realm of routine experimentation and within the purview of the skilled artisan, absent of a showing of evidence or unexpected results indicating that these parameters are critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233,235 (CCPA 1955).

Yamaguchi does not explicitly teach the claimed electrolyte of the general formula (1). However, Schmidt teaches a secondary battery in which the electrolyte solution comprises an

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aprotic solvent having at least an electrolyte dissolved therein, and the electrolyte solution comprises a compound represented by the disclosed formula as shown in par. [0011] as represented by $X-(CYZ)_mSO_2N(CR^1R^2R^3)_2$. In pars. [0047] and [0051], bis (N,N-dimethylamidosulfonyl) difluoromethane is exemplified, as is an amount of 5% by weight.

The skilled artisan would find obvious to modify Yamaguchi by employing the fluorinated sulfonamide of Schmidt. The motivation for such a modification is in view of the fluorinated sulfonamide's properties in increasing the safety of the battery in the case of overloading and in exhibiting good "Leitfähigkeitsverhalten", which translates to conductivity behavior. Schmidt in pars. [0004] and [0010].

Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al. (2002/0037458) in view of Schmidt et al. (EP 1088814), and further in view of Fleischer et al. (U.S. Pat. 6,225,009).

The teachings of Yamaguchi and Schmidt are discussed above.

As to a bismuth compound, Fleischer disclose the inclusion of bismuth oxide, *inter alia*, in the cathode. See Fleisher in col. 14 line 20 et seq. The skilled artisan would find obvious to further modify Yamaguchi by employing a bismuth compound. The motivation for such a modification is to catalyze the cathodic reactions in the electrochemical cell. (*Id.*)

Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al. (2002/0037458) in view of Schmidt et al. (EP 1088814), and further in view of Utsugi et al. (2004/0043300).

The teachings of Yamaguchi and Schmidt are discussed above.

As to the electrolyte further comprising the claimed cyclic monosulfonates of the general formula (2) and general formula (3), Utsugi discloses general formula (9) and general formula (1), respectively. See Utsugi in col. 7 line 45 and col. 12 line 60. The skilled artisan would find obvious to further modify Yamaguchi's invention by employing the claimed cyclic monosulfonates. The motivation for such a modification is to form a passivation coating at the electrode interface and to prevent the elution of manganese from the cathode. See Utsugi in col. 5 line 8 et seq.

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi et al. (2002/0037458) in view of Schmidt et al. (EP 1088814), and further in view of Shiota (U.S. Pat. 5,795,674).

The teachings of Yamaguchi and Schmidt are discussed above.

As to the secondary battery being covered with a laminated exterior package, Shiota disclose that cylindrical manganese-lithium battery are generally provided with a battery cover (in conjunction with a safety valve) formed by laminating metal foil and plastic. See Shiota in col. 1 line 29 et seq. The skilled artisan would find obvious to modify Yamaguchi by employing a laminated exterior. The motivation for such a modification is to prevent bursting of the battery. (Id.)

Response to Arguments

Applicant's arguments filed with the present amendment have been considered but are moot in view of the new ground(s) of rejection. The examiner concedes with applicant's arguments that formula (1) as disclosed by Armand is a salt and not neutral as in the claimed general formula (1). To this end, the prior art rejections relying on Armand have been withdrawn. To the extent that applicant's arguments may be applicable, it is asserted that the fluorinated sulfonamide of Schmidt, as presently relied upon in this Office action, is not a salt and is instead a neutral covalently-bonded compound as in applicant's claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian Anthony whose telephone number is (571) 272-1289. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

/Julian Anthony/
Examiner, Art Unit 1726

/Patrick Joseph Ryan/
Supervisory Patent Examiner, Art Unit 1726